
Human embryonic stem cell derived-mesenchymal stem cells: an alternative mesenchymal stem cell source for regenerative medicine therapy.

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Public Summary:

AIM: To enumerate and characterize mesenchymal stem cells (MSC) derived from human embryonic stem cells (hESC) for clinical application. MATERIALS & METHODS: hESC were differentiated into hESC-MSC and characterized by the expression of surface markers using flow cytometry. hESC-MSC were evaluated with respect to growth kinetics, colony-forming potential, as well as osteogenic and adipogenic differentiation capacity. Immunosuppressive effects were assessed using peripheral blood mononuclear cell (PBMC) proliferation and cytotoxicity assays. RESULTS: hESC-MSC showed similar morphology, and cell surface markers as adipose (AMSC) and bone marrow-derived MSC (BMSC). hESC-MSC exhibited a higher growth rate during early in vitro expansion and equivalent adipogenic and osteogenic differentiation and colony-forming potential as AMSC and BMSC. hESC-MSC demonstrated similar immunosuppressive effects as AMSC and BMSC. CONCLUSION: hESC-MSC were comparable to BMSC and AMSC and hence can be used as an alternative source of MSC for clinical applications.

Scientific Abstract:

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